THERMOELECTRIC EFFECTS IN A DOUBLE QUANTUM DOT ATTACHED TO EXTERNAL METALLIC LEADS

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9.7 cm

Thermoelectric effects in a double quantum dot system coupled to normal and/or ferromagnetic metallic electrodes have been investigated theoretically by means of the non-equilibrium Green function approach. The basic thermoelectric characteristics of the system, in particular the Seebeck coefficient, electronic and thermal conductances, as well as the corresponding figure of merit (ZT) and Lorentz number have been calculated in the linear response theory and in the Hartree-Fock approximation to the electron Coulomb correlations in the quantum dots. We have found a relatively large enhancement ($ZT \gg 1$) of the thermoelectric efficiency due to quantum interference phenomena. We have also shown that the thermoelectric efficiency can be further optimized by tuning temperature of the system. In addition, we have also analyzed spin thermoelectric effects [1,2] in the system under consideration, which appear in the presence of spin accumulation. In the latter case the considerations have been focused especially on the spin thermopower (spin Seebeck coefficient) and the corresponding spin version of the figure of merit.

[1] K. Uchida *et al*, Nature (London) **455**, 778 (2008).
[2] K. Uchida *et al*, Solid State Commun. **150**, 524 (2010).

13.4 cm

Subject category :

4. Spin Electronics and Magneto-Transport

Presentation mode :
poster

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